# DESCRIPTION

## PUSH-TYPE INFORMATION TRANSMISSION METHOD AND TRANSFER DEVICE THEREOF

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### Technical Field

The present invention relates to a push-type information transmission method and system which provides information from a server device to a plurality of user

10    terminals via a network, and a transfer device thereof.

### Background Art

Pull-type information transmission is known conventionally in the field of

15    information providing services which use the Internet.   In general, pull-type information transmission wherein occurs when a user accesses a server device of an information provider from a communication terminal, such as a personal computer or the like, to download desired information has been known conventionally in the field of information providing services which use the Internet.   Additionally, push-type

20    information transmission, wherein information is provided to the user from the server side without awaiting access by a user, has been proposed in recent years.

Communication networks have become more complicated and diversified of late.   Accordingly, so that the forms of networks in which various routers exist between the server device and the user terminal have also increased, such as by

25    interposing a gateway device between the networks with different protocols have also increased.

## Disclosure of the Invention

As the forms of networks continue to diversify as discussed above, various

5    forms of information transmission services will become possible. As one example, it

is possible to supplement a portion of the services involved in information transmission

with a gateway unit instead of server device.

The present invention was made in view of these considerations, and has the

purpose of offering a new form of push-type information transmission method and

10    transfer device thereof, capable of supplementing a part of the services involved in

information transmission between a server device and a user terminal instead of the

server device.

In order to resolve the above problems, a first aspect of the present invention is

a push-type information transmission method in an communication network including

15    an information provider server device, a plurality of user terminals for receiving

information provided by the server device, and a transfer device for routing information

transmission between the server device and the user terminal; wherein the transfer

device comprises:

a step of receiving information mail supplied with a network address of a user

20    terminal designated as a desired destination from the server device;

a step of storing the information mail;

a step of calling the user terminal whose network address has been designated;

and

a step of transmitting the stored information mail in response to a request from

25    the called user terminal.

Additionally, in the above-described first aspect of the present invention, the user terminal may comprise a step of pre-accessing the server device and registering its own network address with the server device as a registration procedure for receiving an information transmission service offered by the server device, and the server device

5    provides information to user terminals which have completed the registration.

Additionally, a second aspect of the present invention is a push-type information transmission method in an communication network including an information provider server device, a plurality of user terminals for receiving information provided by the server device, and a transfer device for routing information

10   transmission between the server device and the user terminal; wherein the transfer device comprises:

a step of pre-storing information relating to user terminals which are to receive an information providing service offered by the server device;

a step of receiving information mail supplied from the server device;

15   a step of storing the information mail;

a step of calling a relevant user terminal based on the pre-stored information relating to user terminals which are to receive an information providing service; and

a step of transmitting the stored information mail in response to a request from the called user terminal.

20   Additionally, in the above-described second aspect of the present invention, the user terminal may comprise a step of pre-accessing the server device and registering its own network address with the server device as a registration procedure for receiving an information transmission service offered by the server device, such that due to this step, information relating to the user terminals which are to receive information providing

services offered by the server device is pre-stored.

Additionally, a third aspect of the present invention is a push-type information transmission method in an communication network including an information provider server device, a plurality of user terminals for receiving information provided by the

5    server device, and a transfer device for routing information transmission between the server device and the user terminal; wherein the transfer device comprises:

a step of storing user attribute data of each user and network addresses of the user terminals in correspondence;

a step of receiving information mail supplied from the server device together

10   with attribute information of users designated as desired destinations;

a step of storing the received information mail;

a step of comparing the stored user attribute data and the designated user attribute data, and specifying network addresses of user terminals corresponding to users having the designated attributes;

15   a step of calling the specified user terminals; and

a step of sending the stored information mail in response to a request from the called user terminals.

Additionally, in the above-mentioned third aspect of the present invention, the user terminal may comprise a step of pre-accessing the server device and registering its

20   own network address with the server device as a registration procedure for receiving an information transmission service offered by the server device, the transfer device calling up user terminals which have completed the registration.

Additionally, a fourth aspect of the present invention is a transfer device for routing information transmissions between an information provider server device and a

plurality of user terminals for receiving the information provided by the server device, comprising:

receiver for receiving information mail supplied from the server device together with a network address of a user terminal designated as a desired destination;

5          storage means for storing the received information mail;

calling means for calling the user terminal whose network address has been designated; and

transmitter for transmitting the stored information mail in response to requests from the called user terminal.

10         Additionally, a fifth aspect of the present invention is a transfer device for routing information transmissions between an information provider server device and a plurality of user terminals for receiving the information provided by the server device, comprising:

memory for pre-recording information relating to a user terminal which is to

15    receive an information providing service offered by the ~~sever~~ server device;

receiver for receiving information mail supplied from the server device;

storage means for storing the received information mail;

calling means for calling relevant user terminals based on information relating to the pre-recorded user terminal which is to receive an information providing service;

20    and

transmitter for transmitting the stored information mail in response to requests from the called user terminal.

Additionally, a sixth aspect of the present invention is a transfer device for routing information transmissions between an information provider server device and a

plurality of user terminals for receiving the information provided by the server device, comprising:

memory for recording user attribute information and a network address of the user terminal in correspondence with each other with respect to each user;

5          receiver for receiving from the server device information mail supplied together with attribute information of a user designated as a desired destination;

storage means for storing the received information mail;

specifying means for comparing the recorded user attribute information with the designated user attribute information, and specifying network addresses of user

10     terminals which correspond to user having the designated attributes;

calling means for calling the specified user terminals; and

transmitter for transmitting the stored information mail in response to requests from the called user terminals.

Additionally, in the present invention, the server device may belong to a first

15     communication network which follows a first communication protocol, and the plurality of user terminals may belong to a second communication network which follows a second communication protocol different from that of the first communication network; and the transfer device may be a gateway for converting between the first and second protocols and routing the exchange of information mails.

20     Additionally, in the present invention, the plurality of user terminals may be given first network addresses used only on the first communication network and are discriminated on the first communication network by second network addresses which have a one-to-one correspondence with the first network addresses in the second communication network; and the transfer device may be such as to convert between

addresses in the first network and addresses in the second network.

Additionally, in the present invention, the second communication network may

be a local network accommodating specific user terminals; and the first communication

network may be a global network interconnecting information resources such as the

5    server device to which are allotted identification information for identifying an absolute

address in the network.

Additionally, in the present invention, the second communication network may

be a mobile communication network accommodating a plurality of user terminals which

are mobile terminals; and the first communication network may be the Internet.

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## Brief Description of the Drawings

Fig. 1 is a block diagram showing the overall structure of an example system

according to an embodiment of the present invention.

15    Fig. 2 is a data format diagram showing the contents of an example subscriber

database ~~according to the same embodiment~~ illustrated in Fig. 1.

Fig. 3 is a block diagram showing ~~the~~ an example structure of a gateway server

~~according to the same embodiment~~ illustrated in Fig. 1.

Fig. 4 is a sequence diagram showing an example of the basic operations of

20    pull-type information transmission ~~according to the same embodiment~~ within the

system illustrated in Fig. 1.

Fig. 5 is a sequence diagram showing an example of the basic operations of

push-type information transmission ~~according to the same embodiment~~ within the

system illustrated in Fig. 1.

25    Fig. 6 is a conceptual diagram showing a first embodiment of the services

according to the ~~same~~-push-type information transmission <u>illustrated in Fig. 5</u>.

Fig. 7 is a conceptual diagram showing a second embodiment of the services according to the ~~same~~-push-type information transmission <u>illustrated in Fig. 5</u>.

Fig. 8 is a flow chart showing a<u>n example</u> billing procedure for the case of the

5    ~~same~~-pull-type information transmission <u>illustrated in Fig. 4</u>.

Fig. 9 is a flow chart showing a<u>n example</u> billing procedure for the case of the ~~same~~-push-type information transmission <u>illustrated in Fig. 5</u>.

Fig. 10 is a screen transition diagram for explaining a variant of the present invention.

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## Best Modes for Carrying Out the Invention

~~Herebelow~~ <u>Hereinafter</u>, an embodiment of the present invention shall be explained with reference to the drawings.   This embodiment is structured as a system

15    wherein the present invention is applied to a mobile packet communication network. The present invention is not restricted to the following embodiment, and various modifications are possible within the range of the technical concept thereof.

A:      Structure of Embodiment

20    (1)    Overall Structure of System

Fig. 1 is a block diagram showing an embodiment of the present invention.

In the drawing, MS denotes a mobile station which receives packet communication services from a mobile packet communication network MPN.   ~~This mobile~~ <u>Mobile</u> station MS is connected ~~not only~~ to the mobile packet communication

25    network MPN shown in the drawing~~, but also~~<u>.   Mobile station MS is also connected</u>

to a mobile telephone network which is not shown, and is therefore capable of receiving

mobile telephone services as well. The mobile station MS comprises ~~an~~ a voice

input-output portion for a user to perform voice communications, a radio portion for

performing radio communications with a base station BS, an information display

5    portion comprising a liquid crystal panel or the like, ~~and~~ an operating portion ~~where~~ to

perform information input operations, such as number input and character input ~~are~~

~~performed~~, and ~~also has~~ an internal microcomputer for controlling these parts.

~~Additionally, the~~ The mobile station MS also has software (i.e., a browser) for browsing

HTML (Hyper Text Markup Language) document data (hereinafter referred to as HTML

10    data). ~~and~~ The software is also for displaying ~~displays~~ an interactive screen for the

user based on HTML data supplied from an information provider (hereinafter

abbreviated to IP) via a mobile packet communication network.

Additionally, the mobile packet communication network MPN comprises a

base station BS, a packet processing module PS, a gateway server GWS, a subscriber

15    database UDB, a billing system BILL and a communication line for connecting these

elements.

The base stations BS are positioned at predetermined intervals obtained by

dividing the ground into ranges of, for example, ~~e.g.~~ a radius of 500 m, and perform

radio communications with mobile stations MS visiting the radio zones formed thereby.

20    The packet processing module PS is a computer system ~~provided~~ in a packet

switching center accommodating a plurality of base stations BS. The packet

processing module PS ~~which~~ receives packet switching requests from the mobile

stations MS (packet switching service registration ~~to be~~ is explained below), and

performs the switching of packets in the mobile packet communication network MPN.

The gateway server GWS is a computer system provided in a mobile packet gateway switching center for interconnecting the mobile packet communication network MPN with other networks such as the Internet INET;. The gateway server GWS which converts communication protocols which differ between the networks.

5   Specifically, the gateway server GWS makes conversions are made between the transmission protocol for mobile packet communications networks used by the mobile packet communication network MPN and the TCP/IP used in other networks such as the Internet INET. Additionally, the gateway server GWS works in cooperation with the IP server W, the subscriber database UDB and the billing system BILL to perform

10   control relating to the various applications, such as information providing services and billing procedures for information transmission.

The subscriber database UDB stores a subscriber registration information file. The subscriber registration information file is composed of information relating to subscribers of the mobile packet communication network MPN and an IP registration

15   information file composed of registration information of the IP (Information Provider). Fig. 2 is a data format diagram showing an example of the content of this subscriber database UDB. As shown in the drawing, the subscriber registration information file contains attribute data indicating the attributes of each subscriber, such as the telephone number of the mobile station MS, name, sex, birthdate and address for each subscriber

20   (i.e., the user of the mobile station MS) in the mobile packet communication network MPN. Additionally, the IP registration information file contains the company name and the absolute address on the network. (e.g.For example, in the case of the Internet, the absolute address on the network is the URL (Uniform Resource Locator) which specifies the information resources on the WWW (World Wide Web); herebelow

hereinafter, the absolute network address in the present embodiment shall be referred to as the URL);.    The IP registration information file also contains information indicating whether the type of billing is IP billing or not (e.g., IP billing or user billing), and information indicating whether the type of billing depends on the amount or is

5    fixed-rate, for each IP which is contracted contracts to receive gateway services with the company which runs this the mobile packet communication network MPN.   Here, IP billing refers to billing for information transmissions service which is performed, not with respect to billing the user who received the transmission service, but with respect to billing the information provider IP.   On the other hand, billing with respect to the

10    user shall hereinafter be referred to as user billing.

The billing system BILL calculates the fees for the providing of services, based on service history information supplied from the gateway server, and issues a bill to the user or the IP.   While billing Billing types include user billing, and IP billing, as well as amount-dependent, and fixed-rate., the The billing system BILL performs billing in

15    accordance with each billing type.

The IP server W is a server system run by the IP, which sends information to be provided to the users over a network in an HTML data format.   The IP server W can be connected to the gateway server GWS via an exclusive line or the Internet INET, as shown in Fig. 1.   As shown in Fig. 3, the IP server W, can also be provided inside the

20    gateway server GWS which is provided by the owner of the mobile packet communication network MPN (hereafter referred to as an IP server W-MAX).

(2)    Structure of Gateway Server

Next, the structure of the gateway server GWS shall be explained.   Fig. 3 is a block diagram showing the structure of a gateway server GWS.   In the drawing, the

gateway server GWS comprises a system control portion I-MAX, a user information managing portion U-MAX, a billing managing portion P-MAX, an electronic mail managing portion M-MAX, an IP server W-MAX and a bus BUS for connecting these ~~parts~~ portions.

5         The system control portion I-MAX controls the various portions of the gateway server GWS, and functions as an interface between networks. ~~such as by performing~~ For example, the system control portion I-MAX may perform protocol conversion between the mobile packet communication network MPN and other networks such as the Internet INET.

10         The user information managing portion U-MAX stores and manages subscriber registration information and IP registration information obtained by referencing the subscriber database UDB, ~~as well as~~ the correspondence between telephone numbers of the mobile stations and user management numbers (to be explained below) and the access histories of users to the IP server W (for example, the number of accesses to each

15   IP server). Additionally, the user information managing portion U-MAX ~~performs conversions~~ converts between the telephone numbers and user management number, ~~collation of~~ collates telephone numbers and ~~comparison of~~ compares attribute data based on the above stored information.

        The billing managing portion P-MAX records and manages information

20   necessary for billing with respect to the information transmission services, and supplies this information to the billing system BILL. Specifically, it stores the fact that an electronic mail has been received from the IP server W as history information, calculates the number of packets to be exchanged when transmitting the electronic mail to the user, and stores this calculated value. Additionally, the billing managing portion

P-Max P-MAX references the content of the subscriber database UDB transferred to the user information managing portion U-MAX, in order to determine whether or not the billing type for each IP is IP billing, and whether or not it is amount-dependent. The P-MAX then requests billing to the billing system BILL based on the billing type.

5      The electronic mail managing portion M-MAX mediates the exchange of electronic mail between mobile station MS users, between mobile station MS users and users of other networks such as the Internet INET, or between the mobile station MS users and the IP server W.   This electronic mail managing portion M-MAX is provided with includes mailboxes for storing the electronic mails to be transferred for each user

10   or for each IP server W.   There are three types of mailboxes in accordance with the type of mail service, and these with the mailboxes being distinguished by the their addresses of their mailboxes (mail addresses).

(i)   A first mailbox BOX1 is a conventional mailbox, wherein the electronic mail transferred between users is stored at mail addresses assigned for each user.

15   (ii)   Next, a A second mailbox BOX2 is a mailbox for storing electronic mail transmitted from the IP to specific users for the purposes of providing in order to provide information or the like.   Here, a specific user is a user who has already completed registration procedures with respect to the IP.   This second mailbox BOX2 is used in a first type of service due to for push-type information transmission, to be

20   described below.

(iii)   Next, a A third mailbox BOX3, as with similar to the second mailbox BOX2, is a mailbox for storing electronic mail transmitted from the IP to a user for the purposes of providing in order to provide information.   It differs from the second mailbox BOX2 in that, instead of storing electronic mail provided to users which have been pre-registered

in the IP, it stores electronic mail provided to users having attributes (attributes such as sex, age, address, etc.) designated by the IP. This third mailbox BOX3 is used in a second type of service ~~due to~~ for push-type information transmission, ~~to be~~ described below.

5      The IP server W-MAX is a server system provided by the company owning the mobile packet communication network MPN. This IP server W-MAX, like the other IP server W, performs services such as providing information to the users.

B.      Operations of the Embodiment

10      Next, operations of the embodiment having the above-described structure shall be explained.

First, information transmission shall be explained, followed by an explanation of the billing procedures.

B-1.      Information Transmission

15      With regard to the information transmission according to the present embodiment, there is pull-type information transmission in which the user of a mobile station MS receives information transmissions by accessing the IP server W, and push-type information transmission in which information transmission is performed from the IP server W side to specified or non-specified users without waiting for user

20      access. ~~Herebelow~~ Hereinafter, the explanation shall be given separately for these types.

(1)      Pull-type Information Transmission

Fig. 4 is a sequence showing a basic operation for pull-type information transmission.

As shown in the drawing, the mobile station MS performs a packet switching service registration in cooperation with the packet processing module PS (step S1). The packet switching service registration is a preliminary registration procedure for enabling packet switching in a mobile packet communication network ~~MPS~~ MPN.

5      When this packet switching service registration is completed, the mobile station MS sends a line connection request signal to the mobile packet communication network ~~MPS~~ MPN (step S2). ~~This~~ The line connection request signal is sent through the packet processing module PS to the gateway server GWS (step S3). If a line connection is possible, then the gateway server GWS sends a line connection response

10     signal through the packet processing module PS back to the mobile station MS (steps S4, S5). As a result, packet switching ~~becomes possible~~ is enabled between the mobile station MS and the gateway server GWS.

Next, the mobile station MS sends a connection request signal designating the URL of a desired IP server W (step S6). This connection request signal is routed

15     through the packet processing module PS and sent to the gateway server GWS (step S7). The gateway server GWS receives the connection request signal, and establishes a link with the IP server W of the designated URL (step S8).

When a link has been established with the gateway server GWS in this way, the IP server W sends HTML data which has been prepared beforehand to the mobile

20     station MS (step S9). This HTML data is routed through the gateway server GWS and transferred to the packet processing module PS (step S10). Furthermore, ~~at the packet processing module PS,~~ the ~~received~~ HTML data received at the packet processing module PS is transferred to the mobile station MS (step S11).

The operations of the above steps S6-S11 are repeatedly performed in

accordance with the amount of all of the data to be transmitted from the IP server W to the mobile station MS. At this time, the The mobile station MS interprets the sequentially transmitted HTML data by means of the browser and displays the received information at the information display portion.

5        When the data transmission to the mobile station MS has been completed, the mobile station MS sends an acknowledgement signal (step S12). The packet processing module PS transfers this acknowledgement signal to the gateway server GWS so as to make a data delivery notification (step S13). When the IP server W completes the data transmission to the mobile station MS, the link between the gateway

10     server GWS and the IP server W is released (step S14).

       Additionally, when there is a data delivery notification from the mobile station MS to the gateway server GWS, the gateway server GWS performs a billing procedure with respect to for the information transmission. The billing procedure performed at this time shall be described in detail below.

15     (2)     Push-type Information Transmission

       First, the basic operations of the push-type information transmission shall be explained, followed by explanations of two types of services due to that involve push-type information transmission.

       (i)     Basic Operations of Push-type Information Transmission

20     Fig. 5 is a sequence diagram illustrating the basic operations of push-type information transmission.

       In the drawing, an IP server W first sends information to be provided to users to the gateway server GWS in the form of electronic mail (step S21). When the gateway server GWS receives the electronic mail, it stores this the electronic mail in the

designated mailbox and sends a communication start notification signal to the packet

processing module PS (step S22).   This communication start notification signal

includes information designating the destination address of the electronic mail.   When

the packet processing module PS receives this communication start notification signal,

5   it calls the mobile station MS corresponding to the destination address included in the

signal (step S23).

When the user of the mobile station MS performs a specified operation on the

mobile station MS in response to the call, the same sequence as ~~the above described~~

previously described with reference to steps S1-S5 (shown in Fig. 4) is performed.~~, and~~

10   ~~it~~   The mobile station enters a state of being capable of packet switching with the

gateway server GWS (steps S24-S28).   Next, the gateway server GWS sends a

reception notification signal, including the address information of the mailbox in which

the electronic mail is stored, to the packet processing module PS (step S29).

Furthermore, the packet processing module PS sends the received reception notification

15   signal to the mobile station MS (step S30).

Upon receiving the ~~above described~~ reception notification signal, the mobile

station MS sends a connection request signal designating the address of the mailbox

included in the reception notification signal to the packet processing module PS (step

S31).   This connection request signal is transferred through the packet processing

20   module PS to the gateway server GWS (step S32).   Upon receiving the connection

request signal, the gateway server GWS sends a connection ~~acnowledgement~~

acknowledgement signal to the packet processing module PS (step S33).   The packet

processing module PS sends the received connection ~~acnowledgement~~

acknowledgement signal to the mobile station MS (step S34).

Next, the gateway server GWS reads the electronic mail received from the IP server W from the mailbox whose address is designated in the connection request signal, and transfers the electronic mail to the packet processing module PS (step S35).    Upon receiving the electronic mail, the packet processing module PS sends this mail to the

5    mobile station MS which issued the connection request (step S36).

The operations of the above steps S31-S36 are repeatedly performed in accordance with the amount of data in the electronic mail to be transmitted from the IP server W to the mobile station MS.

When the mobile station MS has received the electronic mail in this way, a

10    delivery notification is sent to the gateway server GWS in the same manner as in steps S12 and S13 shown in Fig. 4 (steps S37, S38), and the push-type information transmission is completed.

Additionally, if there is a data delivery notification from the mobile station MS to the gateway server GWS, then the gateway server GWS performs a billing procedure

15    with respect to for the information transmission.    The billing procedure performed at this time shall be described in detail below.

(ii)    First Type of Service by means of involving Push-type Information Transmission

In the present embodiment, there are two types of services by means of involving push-type information transmission. A first type shall now be described.

20    The first type is a service of transmitting electronic mail from the IP server for the purpose of providing certain information to users who have completed a registration procedure with the IP beforehand. , wherein the The electronic mail is stored in the second mailbox BOX2, and the electronic mail is transmitted in response to a user request after the user has been called.

Fig. 6 is a conceptual diagram for explaining the first type.   In this drawing, a

user who desires services, such as information ~~provision of~~ provided by a specific IP,

operates a mobile station MS to access the network, and performs preliminary

registration procedures with respect to the IP server (step S61).   With this access, the

5     subscriber number of the user (i.e., the telephone number of the mobile station MS) is

transferred to the gateway server GWS.   The gateway server GWS converts the

received subscriber number into a user management number, which is user identity

information having a one-to-one correspondence with the telephone number in the user

information managing portion U-MAX.~~in order to~~   The user management number is

10    used to avoid the telephone number from being sent outside the packet communication

network MPN.   This user management number is sent from the gateway server GWS

to the IP server W, and is stored in the IP server W as user registration information (step

S62).

Then, if the IP server W has information to be provided to a registered user, the

15    IP server W arranges the information as transmission data in the form of electronic mail,

appends to the electronic mail the address of the second mailbox BOX2 and the user

management number of the registered user to which the information is to be provided,

and sends the mail to the gateway server GWS (step S63).

When the gateway server GWS receives the electronic mail from the IP server

20    W, it stores the mail in the second mailbox BOX2 of the electronic mail managing

portion M-MAX, ~~and~~ converts the designated user management number to the

corresponding telephone number in the user information managing portion U-MAX,

and calls the mobile station MS of that telephone number (step S64).

If the user of the mobile station MS who has received this call desires to

receive the information provided by the IP server, the user operates the mobile station

MS to access the gateway server GWS and requests a download of the electronic mail

(step S65).   The download request signal sent to the gateway server GWS at this time

contains the telephone number of the mobile station MS ~~which~~ that is the source of the

5      request.   The gateway server GWS compares the telephone number of the mobile

station MS from which the request signal ~~is~~ originated ~~and~~ with the telephone number

corresponding to the user management number designated by the IP server W at the

time of reception of the electronic mail in the user information managing portion

U-MAX~~;~~.   Based on the comparison, the gateway server GWS ~~thereby judging~~

10     determines whether or not to permit access to the second mailbox BOX2, and thereafter

reads the electronic mail from the mailbox BOX2 and sends it to the mobile station MS

(steps S66, S67).

        In this way, it is possible to provide information to specific users registered

with the IP server W.

15     (iii)    Second Type of Service ~~by means of~~ involving Push-type Information

Transmission

        ~~Next, the second type shall be explained.~~   The second type is a service

whereby electronic mail, sent from the IP server for the purposes of providing

information to users having attributes (attributes such as sex, age and address)

20     designated by the IP server, is stored in a third mailbox BOX3~~., and the~~   The

electronic mail is transmitted to relevant users in response to user requests after ~~they~~ the

relevant users have been called.

        Fig. 7 is a conceptual diagram for explaining ~~a~~ the second type.   In the

drawing, users who are prepared to receive services such as information ~~provision~~

provided from an unspecified IP operate the mobile station MS to access the network,

and perform preliminary registration procedures with respect to the gateway server

GWS (step S71).   With this access, the telephone number of the mobile station MS is

transferred to the gateway server GWS., and this    The telephone number is stored in

5    the user information managing portion U-MAX of the gateway server GWS as user

registration information.

Then, if the IP server W has information to be provided provide to users, the IP

server W arranges the information in electronic mail form, appends attribute data, such

as sex, age and address for specifying the user, to the electronic mail, and sends the mail

10    to the gateway server GWS (step S72).

When the gateway server GWS receives the electronic mail containing the

attribute data from the IP server W, it stores the electronic mail in the third mailbox

BOX3., and in the    The user information managing portion U-MAX, compares the

attribute data appended to the electronic mail with the attribute data of each user

15    registered in the subscriber database UDB in order to specify relevant users.   For

example, if the attributes designated by the IP server W are "men in the their thirties

who live in Tokyo", then a search is made for relevant users having these attributes from

among the users registered in the subscriber database UDB, and the telephone number

of those users are extracted.   The gateway server GWS calls the mobile stations MS of

20    the telephone numbers extracted in this way (step S73).

If the user of a mobile station MS called in this way by the gateway server

GWS wishes to receive the information provided by the IP server, the user operates the

mobile station MS to access the gateway server GWS, and requests a download of

electronic mail (step S74).   At this time, the telephone number of the mobile station

MS, which is the source of the request, is appended to the download request signal sent to the gateway server GWS.   The gateway server GWS, in the user information managing portion U-MAX, compares the telephone number of the mobile station MS ~~from~~ which originated the request signal ~~is originated~~ with the telephone numbers of users who have completed the above-described registration procedure in order to ~~judge~~ determine whether or not to permit access to the third mailbox BOX3,. ~~after~~ After which, ~~it~~ the gateway server GWS reads the electronic mail from the third mailbox BOX3 and sends it to the mobile station MS which made the request (steps S75, S76).

In this way, it is possible for the IP server W to perform an information providing service.   The service is provided to users who desire the provision of information ~~from among users who are prepared to receive information~~ from ~~the~~ unspecified IP server W.

B-2:     Billing Procedure

While types of billing include communication fee billing for communication services and information fee billing for information providing services of IP's, communication fee billing shall be explained as an example in the present embodiment.

Additionally, the billing procedures for the present invention include user billing ~~with respect to~~ for users who have ~~been provided~~ received information and IP ~~(Information Provider)~~ billing for billing the IP's who have provided the information.

In the present embodiment, whether to perform user billing or IP billing is managed by different methods for the case of pull-type information transmission and push-type information transmission.   Both cases shall be explained below.

(1)     ~~In the Case of~~ Pull-type Information Transmission

Generally, in the case of pull-type information transmission, the information is

provided in accordance with a request from the user., so that Thus, user billing is more readily applicable. However, IP billing is more readily applicable in there are cases in which where the IP wishes to provide information free in response to requests from unspecified users for the purposes of advertisement or the like, and in this case, IP

5 billing is more readily applicable. Therefore, in the present embodiment, in the case of pull-type information transmission, user billing is principally applied. in principle and in In exceptional cases where the IP is billed billing is to be applied, the IP which is subject thereto is pre-registered in the subscriber database UDB. Then, the gateway server GWS extracts from the subscriber database UDB a list of URL's of IP servers W

10 to which IP billing is to be applied, and stores it in a memory in the billing managing portion P-MAX as an IP-billing list table.

Fig. 8 is a flow chart showing the billing procedure for pull-type information transmission. In this drawing, the user first operates the mobile station MS to access a designated IP server W. , and upon Upon receiving a delivery acknowledgement

15 signal from the user, the gateway server GWS checks whether or not the URL of the IP server W accessed by the user corresponds to an IP to be IP billed, as listed in the above-described IP-billing list table (step S101).

Here, if If it is not an IP sever server to be IP-billed, then user billing is applied as usual. In this case, the billing managing portion P-MAX of the gateway GWS sends

20 a user management number of the user who received the information transmission and the number of sum of received packets numbers to the billing system BILL (step S102). The billing system BILL calculates a communication fee by multiplying the sum number of packets supplied from the gateway server GWS with by a unit price, and issues a bill to the user specified by the user management number (step S103).

On the other hand, if the URL of the IP server W accessed by the user

corresponds to an IP to be IP-billed, then IP billing is applied.    In this case, the billing

managing portion P-MAX of the gateway server GWS sends the sum of the received

packets and the URL of the IP server W which was accessed to the billing system BILL

5    (step S104).    The billing system BILL calculates the communication fee by

multiplying the ~~sum~~ number of packets supplied from the gateway server GWS ~~with~~ by

a unit price, and issues a bill to the IP (step S105).

(2)        ~~In the Case of~~ Push-type Information Transmission

~~Next, the billing procedure for the case of push-type information transmission~~

10    ~~shall be described.~~  Fig. 9 is a flow chart showing a billing procedure for the case of

push-type information transmission.    In the drawing, when the gateway server GWS

receives electronic mail from the IP server W in the second mailbox BOX2 or the third

mailbox BOX3, it recognizes that there has been an order for push-type information

transmission, and decides to apply IP billing (step S201).    That is, in the case of

15    push-type information transmission, IP billing is more readily applicable to this type of

information transmission, so that in the present embodiment, IP billing is always

applied.

Next, the gateway server GWS specifies the user to ~~which~~ receive the

information ~~is to be provided~~ as described above, and then calls the mobile station MS

20    to transmit the electronic mail received from the IP server to the mobile station MS~~, but~~.

~~in~~   In the case of IP billing, user billing is not performed with respect to this

transmission, and the IP is billed for everything.

In this case, the billing managing portion P-MAX of the gateway server GWS

references the IP registration information stored in the subscriber database UDB, and

checks whether the type of billing to be applied to the IP server W is amount-dependent or fixed-rate (step S202).

If the billing type is amount-dependent, the billing managing portion P-MAX

5    of the gateway server GWS sends the sum of the packets exchanged in the transmission of electronic mail and the URL of the IP server W which was the source of the electronic mail to the billing system BILL (step S203). The billing system BILL multiplies the ~~sum~~ number of the packets supplied from the gateway server GWS ~~with~~ by a unit price to calculate the communication fee, and issues a bill to the IP (step S204).

10    On the other hand, if the billing type is fixed-rate, then the billing managing portion P-MAX of the gateway server GWS sends the URL of the IP server W to the billing system BILL ~~at the same time as~~ when the electronic mail is received from the IP server, so as to ~~order billing to that~~ the IP (step S205). The billing system BILL receives ~~this~~ the URL and issues a bill of a standard amount to the indicated IP (step

15    S206).

If the fixed-rate billing format is one where billing is applied to a standard period of time, such as ~~by~~ monthly ~~units~~, the IP is billed whether or not the electronic mail from the IP server W reaches the gateway server GWS. Therefore, in this case, there is no cooperation between the gateway server GWS and the billing system BILL,

20    and the billing system BILL independently issues a bill to the IP at regular periods.

C:    Modification Examples

As previously mentioned, the present invention is not restricted to the above-described embodiments. The present invention can have various modifications

within the range of the technical concept of the present invention, for example the following.

(1)     In the embodiments, information is provided to mobile stations MS belonging to a mobile packet communication network MPN from another network such as the

5     Internet INET (first communication network).~~, but if~~ If for example there exists ~~another~~ a global network ~~which can replace~~ other than the Internet INET, then the present invention is applicable to cases wherein information is provided from such a network to a mobile station MS belonging to a mobile packet communication network MPN.    In this case, the information resource of the IP server W can be specified by

10     means of an absolute address defined in the global network to which it is applied, instead of by a URL.

Additionally, the network (second communication network) to which the user terminal belongs is not restricted to being a mobile packet communication network MPN.~~, and the~~   The invention is applicable for providing information to user

15     terminals belonging to local networks such as a fixed network which includes stationary terminals.

Furthermore, the present invention is not restricted to packet switching networks, and is applicable to data communication networks which perform other types of data communications.~~, and the~~   The communication protocols indicated in the

20     embodiments represent only one possible example.    Additionally, the form of the data transmitted from the IP server is not restricted to HTML format, and other formats may be employed.    For example, if the transmitted information is only text data, then it is of course not necessary to employ a data format such as HTML which can handle multimedia.

(2)    In the embodiments, the communication fee billing for pull-type information

transmission was uniformly made amount-dependent, but the present invention is not

limited thereto., so that it   It is possible to register information indicating whether the

billing is amount-dependent or fixed-rate in the subscriber database UDB, as in the case

5     of push-type information transmission, and to perform billing procedures in accordance

with the type of billing.   In the case that Where a fixed-rate system is employed for

pull-type information transmission, the user or IP is billed a standard amount regardless

of the number of exchanged packets, as in the case of push-type information

transmission.

10            Additionally, while the billing type was set for each IP in the IP registration file

of the subscriber database UDB in the embodiments, the present invention is not

restricted thereto., and it   It is possible to set the billing type for each user in the

subscriber registration file.   Additionally, when wishing to set the billing type

according to the IP and the user, then the billing type for each user can be set for each IP

15    in the IP registration information file., or   Alternatively, the billing type for each IP

can be set for each user in the subscriber registration information file.

(3)    While only communication fee billing was explained in the embodiments for

the purpose of retaining simplicity, the present invention can be similarly applied to

information fee billing.   However, when When employing amount-dependent

20    information fee billing, billing does not depend on the number of exchanged packets as

in communication fee billing., but it   Instead, it is possible to apply various billing

types such as for example, billing in accordance with the number of exchanged

electronic mails or when wishing to change the amount depending on the case,

appending amount information concerning an electronic mail transmission to the

electronic mail sent from the IP server W ~~to send~~ to the gateway server GWS.

Additionally, in the case of information fee billing, it is possible to perform only user billing and ~~to~~ not to perform IP billing.   In this case, all of the billing types in the IP registration information file in the subscriber database UDB can be set to user

5   billing or the billing procedure can be ~~not performed~~ disabled with respect to IP's which are set for IP billing.

(4)      In the embodiments, the billing type in pull-type information transmission was decided by the gateway server GWS having a list table of IP-billing and referencing the table, but the present invention is not restricted thereto~~, and it~~   It is possible, for

10   example, to append information indicating ~~whether~~ IP billing or not by adding a tag to the HTML data sent from the IP server W~~, and to have the~~   The gateway server GWS may then decide the billing type based on this information.

(5)      The structure of the network in the embodiments is ~~no more than~~ one possible example, and the present invention is not restricted to such a structure.   For example, it

15   is possible to divide up the functions among a plurality of nodes, such as by ~~arranging into divisions of~~ dividing nodes having a communication protocol converting function and nodes having other functions.

(6)      In the embodiments, the IP server W manages user registration information with respect to the IP's in a first type of service by means of push-type information

20   transmission~~, but the present invention may be such that~~   Alternatively, the gateway server GWS ~~may~~ handles the management of user registration information.   For example, as shown in Fig. 10, a sequence of ~~among the~~ dialog screens (1-5) may be displayed when a user performs registration procedures with the IP~~, it is possible to send and display only a~~   A dialog screen (hereafter referred to as a registration screen)

for aiding in the registration operation may be sent as HTML data prepared by the gateway server GWS to the mobile station MS of the user for display., then store and manage the    The user registration information may then be stored and managed at the gateway server GWS based on the user registration procedures.   In this case, it is

5    possible for the gateway server GWS to find determine with which IP server W the user has performed registration procedures.;    The determination may be based on the address information such as the URL designated when the user accesses the IP server W. Therefore, if the The gateway server GWS may therefore provide a registration screen of has HTML data for providing a registration screen with respect to any of a plurality

10    of IP servers W in correspondence to based on the address information such as the URL, then it is possible to specify the The HTML data to be sent to the mobile station MS of the user as a registration screen may also be specified based on the address information, such as the URL designated by the user.

(7)    While in the embodiments, in the case of push-type information transmission,

15    the user of a mobile station MS who has received a call for electronic mail operates the mobile station MS to access the gateway server GWS and download the electronic mail.; but the    The present invention is not restricted thereto., and it    It is possible to make the process such that when the mobile station MS receives a call, it automatically accesses the gateway server GWS and downloads the electronic mail without waiting

20    for the instruction operations of the user.

(8)    In the embodiments, IP billing is always used for push-type information transmission, but the present invention is not restricted thereto., and user    User billing can also be applied in the case of push-type information transmission.   In this case, as with the pull-type information transmission described above, an IP billing list table

should be made based on the set contents of a subscriber database UDB, ~~this table~~ and should be referenced in order to determine whether to use IP billing or user billing~~., and~~ ~~in~~ In the case of user billing, the procedures appropriate for user billing should be followed.

5    Additionally, even in the case of exclusively <u>billing the</u> IP ~~billing~~, it is possible to prepare an IP billing list table for having a list of relevant IP servers to be IP-billed, so that when there is a request for push-type information transmission from an IP server not listed in ~~this~~ <u>IP billing list</u> table~~.~~, <u>The IP billing list table may then be used so that</u> the information transmission will not be routed, such as by disposing of the sent

10   electronic mail.

## CLAIMS

1. A push-type information transmission method in an communication network including an information provider server device, a plurality of user terminals for

5 receiving information provided by said server device, and a transfer device for routing information transmission between said server device and said user terminal; wherein said transfer device comprises:

a step of receiving information mail supplied with a network address of a user terminal designated as a desired destination from said server device;

10 a step of storing said information mail;

a step of calling the user terminal whose network address has been designated; and

a step of transmitting the stored information mail in response to a request from said called user terminal.

15

2. A push-type information transmission method as in claim 1, wherein said user terminal comprises a step of pre-accessing said server device and registering its own network address with said server device as a registration procedure for receiving an information transmission service offered by said server device, and

20 said server device provides information to user terminals which have completed said registration.

3. A push-type information transmission method in an communication network including an information provider server device, a plurality of user terminals for

receiving information provided by said server device, and a transfer device for routing

information transmission between said server device and said user terminal; wherein

said transfer device comprises:

a step of pre-storing information relating to user terminals which are to receive

5     an information providing service offered by said server device;

a step of receiving information mail supplied from said server device;

a step of storing said information mail;

a step of calling a relevant user terminal based on the pre-stored information

relating to user terminals which are to receive an information providing service; and

10          a step of transmitting the stored information mail in response to a request from

the called user terminal.


4.     A push-type information transmission method as in claim 3, wherein said user

terminal comprises a step of pre-accessing said server device and registering its own

15    network address with said server device as a registration procedure for receiving an

information transmission service offered by said server device, and

due to this step, information relating to the user terminals which are to receive

information providing services offered by said server device is pre-stored.


20    5.     A push-type information transmission method in an communication network

including an information provider server device, a plurality of user terminals for

receiving information provided by said server device, and a transfer device for routing

information transmission between said server device and said user terminal; wherein

said transfer device comprises:

a step of storing user attribute data of each user and network addresses of the user terminals in correspondence;

a step of receiving information mail supplied from said server device together with attribute information of users designated as desired destinations;

5          a step of storing said received information mail;

a step of comparing said stored user attribute data and the designated user attribute data, and specifying network addresses of user terminals corresponding to users having the designated attributes;

a step of calling the specified user terminals; and

10          a step of sending the stored information mail in response to a request from said called user terminals.


6.     A push-type information transmission method as in claim 5, wherein said user terminal comprises a step of pre-accessing said server device and registering its own

15   network address with said server device as a registration procedure for receiving an information transmission service offered by said server device, and

said transfer device calls user terminals which have completed said registration.


20   7.     A push-type information transmission method as in any one of claims 1-6, wherein said server device belongs to a first communication network which follows a first communication protocol, said plurality of user terminals belong to a second communication network which follows a second communication protocol different from said first communication protocol; and

said transfer device is a gateway for converting between said first and second communication protocols and routing the exchange of said information mail.

8.  A push-type information transmission method as in claim 7, wherein said

5  plurality of user terminals are given first network addresses used only on said first communication network and are discriminated on said first communication network by second network addresses which have a one-to-one correspondence with said first network addresses in said second communication network; and

said transfer device converts between said second network addresses in said

10  first communication network and said first network addresses in said second communication network.

9.  A push-type information transmission method as in claim 8, wherein said second  communication network is a local network accommodating specific user

15  terminals; and

said first communication network is a global network interconnecting information resources such as said server device to which are allotted identification information for identifying an absolute address in the network.

20  10.  A push-type information transmission method as in claim 9, wherein said second communication network is a mobile communication network accommodating a plurality of user terminals which are mobile stations; and

said first communication network is the Internet.

11.     A transfer device for routing information transmissions between an information

provider server device and a plurality of user terminals for receiving the information

provided by said server device, comprising:

        receiving means for receiving information mail supplied from said server

5    device together with a network address of a user terminal designated as a desired

destination;

        storage means for storing the received information mail;

        calling means for calling the user terminal whose network address has been

designated; and

10        sending means for sending the stored information mail in response to requests

from said called user terminal.

12.     A transfer device for routing information transmissions between an information

provider server device and a plurality of user terminals for receiving the information

15    provided by said server device, comprising:

        memory for pre-recording information relating to a user terminal which is to

receive an information providing service offered by said ~~sever~~ server device;

        receiving means for receiving information mail supplied from said server

device;

20        storage means for storing the received information mail;

        calling means for calling relevant user terminals based on information relating

to the pre-recorded user terminal which is to receive an information providing service;

and

        sending means for sending said stored information mail in response to requests

from said called user terminal.


13.     A transfer device for routing information transmissions between an information

provider server device and a plurality of user terminals for receiving the information

5     provided by said server device, by comprising:

memory for recording user attribute information and a network address of the

user terminal in correspondence with each other with respect to each user;

receiving means for receiving from said server device information mail

supplied together with attribute information of a user designated as a desired

10     destination;

storage means for storing the received information mail;

specifying means for comparing the recorded user attribute information with

the designated user attribute information, and specifying network addresses of user

terminals which correspond to user having the designated attributes;

15     calling means for calling the specified user terminals; and

sending means for sending said stored information mail in response to requests

from the called user terminals.


14.     A transfer device as in any one of claims 11-13, wherein said server device

20     belongs to a first communication network which follows a first communication protocol,

and said plurality of user terminals belong to a second communication network which

follows a second communication protocol different from that of said first

communication network; and

comprising protocol converter for converting between said first and second

protocols.

15.    A transfer device as in claim 14, wherein said plurality of user terminals are given first network addresses used only on said second communication network and are

5    discriminated on said first information transmission network by second network addresses which have a one-to-one correspondence with said first network addresses in said second communication network; and

comprising address converter for converting between said second network addresses in said first communication network and said first network addresses in said

10    second communication network.

16.    A transfer device as in claim 15, wherein said second communication network is a local network accommodating specific user terminals; and

said first communication network is a global network interconnecting

15    information resources such as said server device to which are allotted identification information for identifying an absolute address in the network.

17.    A transfer device as in claim 16, wherein said second communication network is a mobile communication network accommodating a plurality of user terminals which

20    are mobile stations; and

said first communication network is the Internet.

# ABSTRACT

The user of a mobile station which is prepared to receive information providing services from unspecified IP (Information Providers) accesses a gateway server and performs a pre-registration procedure (S71). When an IP server has information to provide to users, it constructs the information in the form of electronic mail, appends user attribute data, and sends this to the gateway server (S72). Upon receiving electronic mail with attribute data, the gateway server stores the electronic mail in a third mailbox, makes a comparison of the user attributes, and calls the mobile stations of relevant users (S73). A user who has received a call requests a download of the electronic mail from the gateway server (S74). The gateway server sends electronic mail to the mobile station which made the request (S75, S76).